

In the Claims:

Please amend claims 2-15, 17 and 18 as follows:

1. (Original) A storage device, comprising:

a disk medium;

a recording and reproducing head that floats over the disk medium and records or reproduces information in the disk medium;

an actuator that supports the recording and reproducing head and moves the recording and reproducing head in a radial direction of the disk medium;

a driving unit that drives the actuator;

a speed detection unit that detects a moving speed of the actuator;

a speed control unit that controls the moving speed of the actuator by a feedback control based on a difference between a detected moving speed of the actuator and a target speed;

a ramp member arranged outside the disk medium used for loading and unloading the recording and reproducing head;

a position detection unit that detects a position of the recording and reproducing head; and

a position determination unit that determines whether the detected position of the recording and reproducing head reaches a first predetermined position in operations of loading or unloading the recording and reproducing head,

wherein

the speed control unit comprises one of a bandwidth switching unit that switches a bandwidth of the feedback control to a wide bandwidth based on a result of the position determination, and a feed-forward compensation unit that adds a predetermined feed-forward control variable to a control variable of the feed-back control based on the result of the position determination.

2. (Currently Amended) ~~The~~A storage device ~~as claimed in claim 1,~~
~~wherein: comprising:~~

a disk medium;

a recording and reproducing head that floats over the disk medium and records
or reproduces information in the disk medium;

an actuator that supports the recording and reproducing head and moves the
recording and reproducing head in a radial direction of the disk medium;

a driving unit that drives the actuator;

a speed detection unit that detects a moving speed of the actuator;

a speed control unit that controls the moving speed of the actuator by a
feedback control based on a difference between a detected moving speed of the actuator and
a target speed;

a ramp member arranged outside the disk medium used for loading and
unloading the recording and reproducing head;

a position detection unit that detects a position of the recording and reproducing head; and

a position determination unit that determines whether the detected position of the recording and reproducing head reaches a first predetermined position in operations of loading or unloading the recording and reproducing head,

wherein the speed control unit comprises one of a bandwidth switching unit that switches a bandwidth of the feedback control to a wide bandwidth based on a result of the position determination, and a feed-forward compensation unit that adds a predetermined feed-forward control variable to a control variable of the feed-back control based on the result of the position determination; and

when the position determination unit determines that the position of the recording and reproducing head reaches the first predetermined position, the bandwidth switching unit switches the bandwidth of the feedback control to the wide bandwidth, or the feed-forward compensation unit adds the predetermined feed-forward control variable to the control variable of the feed-back control.

3. (Currently Amended) ~~The~~A storage device as claimed in claim 1, further comprising:

a disk medium;

a recording and reproducing head that floats over the disk medium and records or reproduces information in the disk medium;

an actuator that supports the recording and reproducing head and moves the recording and reproducing head in a radial direction of the disk medium;

a driving unit that drives the actuator;

a speed detection unit that detects a moving speed of the actuator;

a speed control unit that controls the moving speed of the actuator by a feedback control based on a difference between a detected moving speed of the actuator and a target speed;

a ramp member arranged outside the disk medium used for loading and unloading the recording and reproducing head;

a position detection unit that detects a position of the recording and reproducing head; and

a position determination unit that determines whether the detected position of the recording and reproducing head reaches a first predetermined position in operations of loading or unloading the recording and reproducing head,

wherein the speed control unit comprises one of a bandwidth switching unit that switches a bandwidth of the feedback control to a wide bandwidth based on a result of the position determination, and a feed-forward compensation unit that adds a predetermined feed-forward control variable to a control variable of the feed-back control based on the result of the position determination;

the storage device further comprising a speed change determination unit that determines whether the speed difference exceeds a predetermined value when the position

determination unit determines that the position of the recording and reproducing head reaches the first predetermined position,

wherein:

if the speed change determination unit determines that the speed difference exceeds the predetermined value, the bandwidth switching unit switches the bandwidth of the feedback control to the wide bandwidth, or the feed-forward compensation unit adds the predetermined feed-forward control variable to the control variable of the feed-back control.

4. (Currently Amended) ~~The~~A storage device ~~as claimed in claim 1,~~

~~wherein:~~comprising:

a disk medium;

a recording and reproducing head that floats over the disk medium and records or reproduces information in the disk medium;

an actuator that supports the recording and reproducing head and moves the recording and reproducing head in a radial direction of the disk medium;

a driving unit that drives the actuator;

a speed detection unit that detects a moving speed of the actuator;

a speed control unit that controls the moving speed of the actuator by a feedback control based on a difference between a detected moving speed of the actuator and a target speed;

a ramp member arranged outside the disk medium used for loading and unloading the recording and reproducing head;

a position detection unit that detects a position of the recording and reproducing head; and

a position determination unit that determines whether the detected position of the recording and reproducing head reaches a first predetermined position in operations of loading or unloading the recording and reproducing head,

wherein the speed control unit comprises one of a bandwidth switching unit that switches a bandwidth of the feedback control to a wide bandwidth based on a result of the position determination, and a feed-forward compensation unit that adds a predetermined feed-forward control variable to a control variable of the feed-back control based on the result of the position determination;

wherein in the operation of unloading the recording and reproducing head, the first predetermined position includes a position where the recording and reproduction head is nearly in contact with the ramp member.

5. (Currently Amended) ~~The~~A storage device ~~as claimed in claim 1, the~~
ramp member ~~including~~comprising:

a disk medium;

a recording and reproducing head that floats over the disk medium and records or reproduces information in the disk medium;

an actuator that supports the recording and reproducing head and moves the recording and reproducing head in a radial direction of the disk medium;

a driving unit that drives the actuator;

a speed detection unit that detects a moving speed of the actuator;

a speed control unit that controls the moving speed of the actuator by a feedback control based on a difference between a detected moving speed of the actuator and a target speed;

a ramp member arranged outside the disk medium used for loading and unloading the recording and reproducing head;

a position detection unit that detects a position of the recording and reproducing head; and

a position determination unit that determines whether the detected position of the recording and reproducing head reaches a first predetermined position in operations of loading or unloading the recording and reproducing head,

wherein the speed control unit comprises one of a bandwidth switching unit that switches a bandwidth of the feedback control to a wide bandwidth based on a result of the position determination, and a feed-forward compensation unit that adds a predetermined feed-forward control variable to a control variable of the feed-back control based on the result of the position determination;

the ramp member including a slope portion having a surface inclined relative to a surface of the disk medium, said slope portion raising the recording and reproducing head

away from the disk medium in the operation of unloading the recording and reproducing head; and

a flat portion parallel to the surface of the disk medium and connected to the slope portion; wherein

in the operation of loading the recording and reproducing head, the first predetermined position includes a position at a boundary of the slope portion and the flat portion.

6. (Currently Amended) ~~The~~A storage device ~~as claimed in claim 1,~~
wherein: comprising:

a disk medium;

a recording and reproducing head that floats over the disk medium and records or reproduces information in the disk medium;

an actuator that supports the recording and reproducing head and moves the recording and reproducing head in a radial direction of the disk medium;

a driving unit that drives the actuator;

a speed detection unit that detects a moving speed of the actuator;

a speed control unit that controls the moving speed of the actuator by a feedback control based on a difference between a detected moving speed of the actuator and a target speed;

a ramp member arranged outside the disk medium used for loading and unloading the recording and reproducing head;

a position detection unit that detects a position of the recording and reproducing head; and

a position determination unit that determines whether the detected position of the recording and reproducing head reaches a first predetermined position in operations of loading or unloading the recording and reproducing head,

wherein the speed control unit comprises one of a bandwidth switching unit that switches a bandwidth of the feedback control to a wide bandwidth based on a result of the position determination, and a feed-forward compensation unit that adds a predetermined feed-forward control variable to a control variable of the feed-back control based on the result of the position determination; and

wherein the position detection unit detects the position of the recording and reproducing head by calculating a distance from a reference position to the position of the recording and reproducing head.

7. (Original) The storage device as claimed in claim 6, wherein:

the position detection unit calculates the distance by integrating the moving speed of the actuator detected by the speed detection unit.

8. (Original) The storage device as claimed in claim 6, further comprising a position displaying unit that displays the position of the actuator,

wherein:

the position detection unit calculates the distance by using the position of the actuator displayed in the position displaying unit.

9. (Original) The storage device as claimed in claim 8, wherein:

the position displaying unit includes one of a rotary encoder mounted on the actuator and an optical scale mounted on the actuator.

10. (Original) The storage device as claimed in claim 6, wherein:

the reference position includes a position where the actuator is mechanically limited and mechanically stopped.

11. (Original) The storage device as claimed in claim 6, wherein:

the disk medium is a magnetic disk medium; and

the reference position includes a predetermined cylinder position based on servo information recorded in the magnetic disk medium.

12. (Original) The storage device as claimed in claim 11, wherein:
the predetermined cylinder position is a position of a cylinder at the periphery
of the magnetic disk medium.

13. (Original) The storage device as claimed in claim 12, wherein:
the cylinder at the periphery of the magnetic disk medium is the outermost
cylinder of the magnetic disk medium.

14. (Original) The storage device as claimed in claim 1, wherein:
a second predetermined position is provided;
and when the position determination unit determines that the position of the
recording and reproducing head reaches the second predetermined position, the bandwidth
switching unit switches the bandwidth of the feedback control to a narrow bandwidth, or the
feed-forward compensation unit stops adding the predetermined feed-forward control
variable to the control variable of the feed-back control.

15. (Original) The storage device as claimed in claim 14, the ramp
member including:

a slope portion having a surface inclined relative to a surface of the disk
medium, said slope portion raising the recording and reproducing head away from the disk
medium in the operation of unloading the recording and reproducing head; and

a flat portion parallel to the surface of the disk medium and connected to the slope portion; wherein

in the operation of unloading the recording and reproducing head, the second predetermined position includes a position at a boundary of the slope portion and the flat portion; and

in the operation of loading the recording and reproducing head, the second predetermined position includes a position where the recording and reproducing head is substantially out of contact with the slope portion.

16. (Original) A method of controlling movement of an actuator that supports a recording and reproducing head floating over a disk medium and recording or reproducing information in the disk medium, moves the recording and reproducing head in a radial direction of the disk medium, and loads or unloads the recording and reproducing head by using a ramp member arranged outside the disk medium, the method comprising the steps of:

detecting a moving speed of the actuator;

controlling the moving speed of the actuator by a feedback control based on a difference between the detected moving speed and a target speed;

detecting a position of the recording and reproducing head in operations of loading or unloading the recording and reproducing head;

determining whether the detected position of the recording and reproducing head reaches a predetermined position; and

switching a bandwidth of the feedback control to a wide bandwidth or adding a predetermined feed-forward control variable to a control variable of the feed-back control based on the result of the position determination.

17. (Currently Amended) ~~The~~A method as ~~claimed in claim 16, wherein~~
of controlling movement of an actuator that supports a recording and reproducing head
floating over a disk medium and recording or reproducing information in the disk medium,
moves the recording and reproducing head in a radial direction of the disk medium, and loads
or unloads the recording and reproducing head by using a ramp member arranged outside the
disk medium, the method comprising the steps of:

detecting a moving speed of the actuator;

controlling the moving speed of the actuator by a feedback control based on a
difference between the detected moving speed and a target speed;

detecting a position of the recording and reproducing head in operations of
loading or unloading the recording and reproducing head;

determining whether the detected position of the recording and reproducing
head reaches a predetermined position; and

switching a bandwidth of the feedback control to a wide bandwidth or adding a predetermined feed-forward control variable to a control variable of the feed-back control based on the result of the position determination;

wherein the step of switching is executed when it is determined that the detected position of the recording and reproducing head reaches the predetermined position in the step of determining.

18. (Currently Amended) ~~The~~A method as claimed in claim 16, further
of controlling movement of an actuator that supports a recording and reproducing head
floating over a disk medium and recording or reproducing information in the disk medium,
moves the recording and reproducing head in a radial direction of the disk medium, and loads
or unloads the recording and reproducing head by using a ramp member arranged outside the
disk medium, the method comprising the steps of:

detecting a moving speed of the actuator;

controlling the moving speed of the actuator by a feedback control based on a
difference between the detected moving speed and a target speed;

detecting a position of the recording and reproducing head in operations of
loading or unloading the recording and reproducing head;

determining whether the detected position of the recording and reproducing
head reaches a predetermined position; and

switching a bandwidth of the feedback control to a wide bandwidth or adding a predetermined feed-forward control variable to a control variable of the feed-back control based on the result of the position determination; the method further comprising, after the step of determining and before the step of switching, a step of determining whether the speed difference exceeds a predetermined value when it is determined that the position of the recording and reproducing head reaches the predetermined position,

wherein:

the step of switching is executed when it is determined that the speed difference is greater than the predetermined value.